UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
SR-6J

VIA ELECTRONIC MAIL

May 1, 2018

Michael H. Samples
de maximis, inc.
450 Montbrook Lane
Knoxville, Tennessee 37919

Subject: Remedial Investigation Report, dated February 2018- U.S. EPA Comment Letter
Gary Development Landfill Site, Gary, Indiana
CERCLIS ID No: IND077005916

Dear Mr. Samples:

The U.S. Environmental Protection Agency has completed its review of the Remedial Investigation (RI) Report for the Gary Development Landfill Site. The RI Report, dated February 2018, was prepared by Parsons Corporation (Parsons) on behalf of the Gary Development Landfill Respondents.

EPA is providing comments below that must be addressed in a Final RI Report. Please provide your response to the comments below within 15 days. The Final RI Report is due 30 calendar days after receipt of U.S. EPA's notification of deficiencies, pursuant to Section II of the Statement of Work and Section X of the Administrative Settlement Agreement and Order on Consent dated May 5, 2014. If you have any questions, please feel free to contact me at (312) 353-7921, or by e-mail at blake.leslie@epa.gov.

Sincerely,

Leslie Blake

Leslie Blake
Remedial Project Manager

Attachments: 1. IDEM Comment Letter

cc: (*via e-mail*)
Jeffrey Cahn, EPA
Stephanie Andrews, IDEM

RI Report text- General Comments:

1. *Report Organization*. The report organization is such that items are discussed in one section then the results are presented in various locations in the report. For example, in Section 2.0 presents detailed sampling analysis summaries in text and table format yet, summary tables are presented in both Section 2.0 and Section 4.0. EPA recommends grouping all summary tables in one section of the report.

2. *Subjective Terminology*. The report includes subjective terminology in several locations, particularly when discussing groundwater conductivity and velocity. Terms such as "slow", "relatively slow", "low" and "high" should be avoided; however, if used, the terms should be applied consistently. Hydraulic conductivity (k) is described sufficiently in conjunction with associated soil type; velocity presented in terms of scale (e.g., Velocity page 3-4) is sufficient and appropriate for this report.

3. *Figures*. Several figures contain purple contour lines against an aerial photograph background (e.g., Figure 1-2, Site Plan), which makes the figure hard to review. EPA recommends changing the color of these contour lines to provide a sharper contrast to improve ease of comprehension during review.

4. *Landfill Profile*. The report tends to describe the landfill contents and cover fill as part of the "geology" of the site. EPA recommends improving the discussion by describing a "profile" with the landfill contents/cover fill underlain by the geology of the site within the framework of a conceptual site model.

5. *Presumptive Remedy Approach*. EPA did ***not*** approve or pre-determine that the presumptive remedy would be used at the site. In a letter dated August 21, 2015, EPA and IDEM approved the use of the presumptive remedy guidance at the site. Please remove all references to approval of the presumptive remedy at the site.

6. *PFAS Sampling*. EPA recommends a discussion with the Respondents regarding the possibility of Perfluoroalkyl Substances (PFAS) contamination at the site. Landfills can be a source of PFAS if waste containing PFAS was deposited in the landfill. Numerous consumer and industrial products including paints and varnish contain PFAS. For example, according to the waste stream table, oils and paint sludges were deposited in the landfill. (*See* Petition Justifying the Application of EPA's Presumptive Remedy Approach, May 22, 2015).

RI Report text- Specific Comments:

1. *Executive Summary, Nature and Extent of Impacts.* Text states, "Groundwater contained only a few chemical constituents above screening levels, including petroleum compounds…". Data indicate widespread benzene impacts to groundwater, especially in the northeastern corner of the site. This statement is misleading.

2. *Executive Summary, Fate and Transport*. Text indicates groundwater flows radially outward from the landfill but is, "expected to quickly turn southerly towards the river on both the east

and west sides of the site before approaching the buildings." The RI included no data to support this statement.

3. *Section 1.1, Purpose*. The text states: "In a letter dated August 21, 2015, the USEPA approved a presumptive remedy of containment/capping for the Site". EPA did ***not*** approve or pre-determine that the presumptive remedy would be used at the site. In that same letter, EPA and IDEM approved the use of the presumptive remedy guidance at the site. Please remove this statement and all reference to a pre-determination that the presumptive remedy will be implemented at the site.

4. *Section 1.3.1, Site Use History and Ownership*. Text indicates that the landfill was approved for use as a solid waste landfill in 1974; however, "an industrial/sanitary landfill was operated at the Site…" The report needs to include known or suspected industrial wastes that were disposed of in the landfill. Please review the Hazard Ranking System (HRS) evaluation report (March 2011), the Agency for Toxic Substances Disease Registry (ATSDR) Health Consultation Report (August 2012), and any information that may be obtained elsewhere such as the 104(e) Information Request filing for such information and present the discussion in the report.

5. *Section 1.3.1, Site Use, History, and Ownership*. The text indicates that the landfill is comprised of three separate parcels of land. The parcels, along with its present owner (as of date of the report or close to it) and parcel ID numbers should be included on a figure.

6. *Section 1.3.2, Historical Data Summary*. Third paragraph, third bullet. Historical data indicates that liquid wastes, including oily wastes, were disposed of at the landfill. As this information is incomplete, the total amount of wastes and types of wastes remain unknown. Furthermore, it has been years since there was a potentially induced inward gradient at the site. Instead, there have been years of an outward gradient, with a driving head as outlined in the RI which could be contributing to the impacts located in the southern wetland area. There is insufficient data to write off the contamination in the southern area as being due contamination from the river. Therefore, the RI and FS will need to address impacts in the southern wetland area.

7. *Figure 1-2*. The contour lines are in purple, and are difficult to see on the background map. The color of the contour lines should be changed to a different color which provides better contrast.

8. *Figure 1-3*. This figure is misleading in that not all of the "Superfund Sites" have been listed on the NPL. Please revise the figure to indicate which sites were/are listed on the NPL, and which were investigated or addressed under other parts of the Superfund program.

9. *Section 2.1.1, second paragraph*. The last sentence appears to have a typographical error and should be "PCBs" rather than "PBCs".

10. *Section 2.1.4, Groundwater evaluation*. A copy of the current version of the groundwater ordinance should be included with the RI Report. Appendix C would be an appropriate place

for it. A review of the ordinance indicates that non-potable use of groundwater is permitted. This will have to be addressed in an RAO, the FS, and the selected remedy, as waste is not present on all areas of the site.

11. *Section 2.1.4, monitoring well installation subsection*. Please indicate whether or not an Indiana licensed driller was used to install the monitoring wells.

12. *Section 2.1.5 Landfill Evaluation*. A) Provide an estimate of the volume of materials present in the landfill, based on available information. This section is a good location for that information, but another section (Section 3 or Section 4) would also be appropriate. B) This section indicates that Section 4.9 includes a discussion of waste boundaries. Section 4.9 discusses the extent of NAPL, not waste boundaries.

13. *Figures 2-5 through 2.9, and 2.11 through 2.13*. The purple contour lines are difficult to see on these figures and provide information important to understanding the site. Please change to a more visible color.

14. *Section 3.1.2, Hydrogeology, page 3-3, last paragraph*. The text states, "Vertical gradients for selected monitoring wells groups were calculated corresponding to five gauging events: November and December 2016 and March, July and October 2017 (Table 3-3)". Table 3-3 indicates MW02, MW06 and MW08 clusters were used in this analysis over the time period listed. Several other GP clusters were used in this analysis, but over the November 2016, March 2017 and October 2017 timeframe. Please revise text to include this information.

15. *Section 3.2 Ecological Evaluation, third paragraph*. Figure 1-2 does not show the wetland boundary as the last sentence of this paragraph indicates.

16. *Table 3-1*. Contains a typographical error in the table title ("Testingl").

17. *Table 3-2*. Contains two blank cells. EPA requests entering "NA" and linking the entry with the footnote on the table.

18. *Figures 3-1 and 3-2, Geologic Cross Sections A-A', B-B', C-C' and D-D'*. EPA has several comments as follows:
    a. Horizontal and vertical scales should be included on all cross sections. EPA recommends placing vertical scales on the left and right side of each cross section.
    b. Boreholes should be displayed on each cross section to support the borehole data that the cross section is based on.
    c. The current transect lines do not intersect any borings within the landfill such as MW-11, MW-12, and MW-13. Inclusion of those borings would assist in depicting the subsurface within the landfill perimeter.
    d. The subsurface between two borings is inferred. EPA recommends using a dashed line, or something similar, to indicate the extrapolation.
    e. Surficial Clay and Surficial Fill on the cross sections are difficult to differentiate. EPA recommends adjusting the shading to allow easier identification of these units.

f. The plan view of the cross sections, shown in the upper left-hand corner of each cross section, should only include the specific borings used in creating the cross sections.
g. The information and three-dimensional rendering used to generate these cross sections can be used to estimate the volume of fill and waste materials which are presently located within the landfill.

19. *Section 3.0 Figures*. At least one figure showing both groundwater potentiometric surface and surface elevation contours would be useful. It appears that the shallow groundwater follows surface contours within the waste disposal area.

20. *Section 4.0*. Neither Section 4.0 nor Section 3.0 contain a discussion of the extent of waste from the landfill. A discussion of the extent of waste, including any waste which is located at or beyond property boundaries should be included. In particular, the extent of waste relative to property lines, and the extent of waste relative to the Grand Calumet River are important. The Waste Boundary report should be included in one of the appendices.

21. *Section 4.5, Groundwater, page 4-5, 1st bullet*. A) Text states, "Petroleum constituents (benzene, toluene and ethylbenzene and xylenes) were observed at concentrations greater than criteria in the northeastern corner…with higher concentrations in MW06S." Data indicate that benzene was detected at over 900 times the MCL in the sample collected in October 2017, and generally consistent with the concentration detected in November 2016. Data also indicate benzene at concentrations above the MCL in MW05M, MW06M, MW06D, MW07M and a variety of other shallow wells located along each boundary of the site. Please expand the discussion regarding benzene above the MCL in groundwater.

    B) The text describes benzene, toluene, ethylbenzene, and xylene as "petroleum constituents". While these are frequently associated with petroleum, they are also associated with some of the listed hazardous wastes documented to have been disposed at the Gary Development Landfill. The text should be clarified to indicate that these constituents could be from hazardous wastes.

22. *Section 4.8, Soil Vapor Results*. Methane may not have a health-based concentration, but it is flammable. Methane concentrations should be discussed in relation to the lower explosive limit.

23. *Section 4.9, NAPL Delineation Summary*. Text states, "the chemical composition of the sample from TP52 is similar in composition to numerous sediment samples collected in 2012 and 2014 from the river, adjacent to and upstream of the Site." While this may be a factual statement, documentation regarding industrial waste types and quantities that were disposed of at the site also are a potential source of the observed NAPL. Please include a discussion indicating the landfill as a potential source of NAPL

24. *Section 4.0, tables*. The results of the NAPL sampling should be included in the tables.

25. *Section 5.0, Environmental Fate and Transport*. The first bullet discusses downward flow of water. While this is certainly possible, the groundwater elevations and text earlier in the report indicate that there is a radial flow of groundwater/leachate from the landfill to the perimeter. This radial flow is important, and should be discussed.

26. *Section 5.0, Environmental Fate and Transport, fifth paragraph*. While the river may be a source of the sediments in the southern wetland, it is also possible that the contamination resulted from wastes which were disposed of at the landfill while it was in operation, without the present vegetative growth. Furthermore, it is unlikely that the NAPL comes from the river; a more likely source is the landfill from waste of landfill operations, driven by the radial flow of groundwater. Several abandoned vehicles (trucks and construction equipment) were noted at the landfill and any of these could be the source of a NAPL as it all contained motor oil. There are documents which indicate that the landfill accepted oily wastes. The report should be revised to include this information.

27. *Section 5.3 Persistence and Transport in Southern Wetland Sediment*. The second paragraph of this section indicates that the probable source of contaminants, including NAPL, is the river. This fails to account for the documented disposal of materials which have the same COCs within the landfill, including, but not limited to: 312,000 gallons of decanter tank tar sludge, unspecified volumes of oil sludge, and unspecified liquid oil waste. As many of these wastes reportedly came from generators, transporters, or other disposal facilities located in the area, any similarity to COCs found in the Grand Calumet River is not surprising. It is noted that the PCB concentration of the NAPL is greater than 50 ppm.

28. *Section 5.3, Persistence and Transport in Southern Wetland Sediment*. The fifth paragraph of this section indicates that erosion and transport of soils containing PCBs from other parts of the site is not significant because of the pervasive heavy vegetation. While this statement may be correct for present conditions, in the past, the site was not as vegetated and during landfill operations, dewatering/leachate removal activities, mostly unpermitted, were performed with water discharged to the Grand Calumet River (several references used in the HRS record provide this information). Therefore, there were other ways for COC-contaminated materials, including those contaminated with PCBs, to move about the site in the past.

29. *Section 5.4, Persistence and Transport in Groundwater, last paragraph*. When discussing "shallow groundwater" please clarify if the reference is to groundwater following the topography of the landfill, flowing radially away, or to the deeper regional flow.

30. *Section 5.5, Persistence and Transport in Soil Vapor*. While not a COC due to health concerns, methane is nevertheless a concern at many landfill sites, including this one. A discussion of the fate and transport of methane should be included in the report.

31. *Section 6.0, Risk Assessment Summary and Appendix E – Ecological Evaluation*. EPA has several comments as follows:
    a. Not all the supporting documents are referenced in the narrative. EPA recommends including a reference in the narrative.

b. Remove reference to a pre-determined remedy as stated in the following text: "in which capping/containment is the agreed-upon remedial action". EPA did not approve or pre-determine that the presumptive remedy would be used at the site. Key assumptions related to the presumptive remedy approach (such as the elimination of the direct-contact exposure pathway to future recreational/trespasser receptors) should be identified. Similarly, key assumptions such as how the presumptive remedy approach relates to the ecological risk assessment should be identified.
c. The attachment cover sheets do not have titles nor lists of contents within a specific attachment. EPA requests a title and a list of contents on each attachment title page to be included.
d. EPA recommends an editorial review of Appendix E to be completed for formatting consistency.
e. Upland and wetland test pits were used to determine the soils and hydrology for each environment. EPA requests that the report includes photographs of each of the four test pits.
f. The ecological evaluation is based on one site visit in spring. The growing season for plant species varies. EPA recommends performing additional site visits in summer and fall, at a minimum, to be more thorough. It may also assist in the design of site restoration.

32. *Section 6.1.1, Data Evaluation and Hazard Identification*. Asbestos was not investigated as a potential COC, although there is documentation which indicates that asbestos-containing materials were disposed of at the site. As airborne asbestos is hazardous, sufficient protection would need to be considered from a direct-contact pathway. And any work which involves the excavation of wastes, including regrading or relocating wastes as part of implementing the remedy, will have to take appropriate precautions.

33. *Section 6.1.3, Exposure Assessment*. The fourth paragraph indicates that the City of Gary has a 2006 ordinance which prohibits drinking water wells. It should be noted that this is not an absolute prohibition, that if piped water is not available, a potable water well may be installed so long as it draws from the deep confined aquifer, and not the shallow unconfined aquifer. Furthermore, the installation of wells for non-potable water supply is permitted. The text indicates that an assumption was made that the installation of drinking water wells will be prohibited in the future. The HHRA should consider whether the incidental, industrial/commercial contact to groundwater, may occur if non-potable water is used and represents a risk which needs to be addressed. Alternatively, the remedy would have to include a prohibition on all groundwater use, except that required for monitoring and/or any treatment which might be part of the remedy.

34. *Section 6.1.4, Risk Characterization*. While there may be no risks identified above 1E-04, a simplified risk assessment was performed which included the assumption that the presumptive remedy (landfill final cover) will be installed. As HHRAs are normally written based upon current conditions, the inclusion of presumptive remedy conditions in the risk assessment is not needed and can be moved to feasibility study documents when decisions on any potential remediation is being discussed.

35. *Section 6.3, Risk Assessment Summary*. For the discussion of the northern pond, there is no indication that a fish survey has been performed for the northern pond. If not, a fish survey should be performed as part of pre-design studies to better evaluate if there are any fish in the pond, and if so, what measures may be needed to address this pathway.

36. *Section 7.0, Summary and Conclusions, page 7-1, first bullet*. While the information presented in this bullet is correct, it is a bit misleading because the site is not described as being a source itself of hazardous substances. Although only information is available regarding only a small portion of the waste disposed at the site, that information indicates that hazardous wastes and substances were known to have been disposed of at the site.

37. *Section 7.0, Summary and Conclusions, page 7-1, fourth bullet*. While this statement is generally factual, it should be noted groundwater flow immediately adjacent to the site and in the deep zone has not been fully established during this investigation.

38. *Section 7.0, Summary and Conclusions, page 7-1, eighth bullet*. Sufficient information exists regarding the types and amounts of industrial waste that were disposed of at the site. Chemical analysis of the sample collected at TP52 supports the position that the landfill contents may constitute a continuing source of NAPL as observed in the test pits along the southern boundary. The geospatial position of the test pits and the observations made at those locations alone does not establish the river as the sole source of contaminants in the form of NAPL at the site. EPA requests that definitive language is striken and a discussion is included that a data gap may exist that requires further evaluation.

39. *Section 7.0, Summary and Conclusions, page 7-1, first bullet*. Although not listed as a COC due to health concerns, the presence of methane at the landfill does present a potential physical hazard (explosion) and should be discussed, both in terms of on-site and off-site receptors.

40. *Section 7.0, Summary and Conclusions, page 7-2, 2nd bullet*. EPA requests that this bullet is expanded to include a more robust discussion regarding the potential for benzene in groundwater to migrate off-site to the northeast and the landfill as a continuing source of NAPL along the southern boundary. Such discussion should include mention of a potential data gap and steps that may be taken to address off-site impacts.

41. *Appendix E*. Some of the attachments are out of order in the electronic version of the document (i.e., attachment 4 is located prior to attachment 3).

Appendix F- Data Validation Reports General Comments:

1. *Documentation*. Chain-of-custody forms, field documentation and laboratory reports were not provided with this document. As a result, EPA's data review is limited to the comparison against associated work plans, reported analytical results and associated data validation (DV) reports.

2. *DV Reports*. The DV reports included in Appendix F are organized by matrices: sediments, surface water, groundwater (quarterly sampling), surface soil, soil borings (landfill and monitoring well), soil vapor and ambient air samples. DV Reports each include multiple Sample Delivery Groups (SDGs) and associated qualified data summary tables.

3. *Data Validation Clarification*. The RI report indicates that data validation "included 100% Level 4 validation of chemical analytical data in accordance with USEPA National Function Guidelines". The final QAPP Worksheet # 11 provides a description of data quality levels of which Level III data "are not subject to formal data validation" and Level IV data are "generated using USEPA methods and enhanced by a rigorous QA program, supporting documentation, and data validation procedures". Some minor clarification is warranted since a Stage 3 was specified in the QAPP, but the RI report indicates that 100 percent (%) Level 4 was performed. This may be misinterpreted. The QAPP defines data quality objective levels. Stages of validation are identified in EPA's Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use.

4. *Validation and Verification Checks*. Worksheet #36 of the QAPP indicates that a Staged Electronic Data Deliverable (SEDD) Stage 3 electronic and manual validation be performed (S3VEM) including 100% of data packages validated, 10% of raw data reviewed, and 10% of results to be recalculated. Description of the items reviewed for data validation in Appendix F are consistent with a Stage 2B manual review. Data validation reports consist of general summaries of findings and discrepancies. However, confirmation that 10% of the raw data were reviewed, 10% of the results were recalculated, or electronic review was performed was not achieved as the results of these verification and validation checks are not assessed within the DV reports.

5. *Crosswalk Table*. EPA requests that a crosswalk table is included to identify sample IDs, matrices, date of collection, SDGs and analyses performed.

Appendix F- DV Reports Specific Comments:

1. *Section 4.9, NAPL Delineation Summary, page 4-8, 1st bullet*. The RI document indicates that NAPL was observed near the river and sample TP52 was submitted for analysis of VOCs, SVOCs, organochloride pesticides, PCBs, metals, and boiling-range distribution of petroleum fractions. TP52 sample results are not included in the RI; however, these results are reported under a separate document from June 2017 (Parsons 2017). Please include this document as a separate appendix to the RI report.

2. *Table 2-1*. Some sample counts between the validation reports and Table 2-1 do not match. For example:
    a. Table 2-1 indicates that 102 groundwater samples were collected, while the DV report contains results for only 64 samples.
    b. Table 2-1 indicates that 42 sediment samples were collected while the sediment sample DV report indicates 44 samples.
    c. Appendix B indicates a total of 12 bulk sample layers were collected and submitted for analysis to EMSL Analytical Inc.; however, Table 2-1 includes eight asbestos samples.

3. *Table 2-1*. Hardness results reported as milligrams per liter (mg/L) of CaCO3 were not reported for surface water results on Table 4-2, although these may be calculated since metal results (Ca and Mg) are reported.

4. *Data Validation Reports*. In addition to the Test Pit report, there are no DV reports readily listed for "Water from Tanker" and "Surface Water Depression" samples.

5. *Data Validation Reports*. With respect to QAPP worksheet #20, which describes field QC samples to be collected, it appears that adequate QC samples (field duplicates and blanks) were not collected in some cases. For example, the DV report for the Northern Pond and Southern Wetland Sediment Samples indicates 44 field samples and one field duplicate were collected, which does not meet the QAPP-stipulated 5% frequency. EPA requests a re-evaluation of QC samples with respect to the approved QAPP to be performed and accurately reported/justified.

6. *Field Duplicate Reporting*. EPA recommends reporting the higher of the two values (or reporting both values) if a field duplicate is collected. Two examples are as follows:
    a. Figure 4-3 of the RI report (pg. 108 of 334) has the SD07 shallow value (0' to 1') at 220 micrograms per kilogram (µg/kg) for the PCB Aroclor 1248. This sample has a field duplicate with a concentration of 850 µg/kg as shown in Appendix F (pg. 15 of 932).
    b. MW06D Figure 4-10: EPA recommends reporting the higher value (or reporting both values) from the field duplicate for 1,4-dioxane (1,300 versus 1,200 µg/kg).

7. *Table 4-1 and Appendix F*. A discrepancy between Table 4-1 and the validated results in Appendix F for PCB Aroclor 1248 was noted. Please clarify the following results:

Document	Sample	Result (µg/kg)
Table 4-1 (pg. 157 of 334)	SD18S	Blank
Table 4-1 (pg. 157 of 334)	SD18M	49000
Appendix F (pg. 30 of 932)	SD18S	3900
Appendix F (pg. 30 of 932)	SD18M	48000

Appendix J- Human Health Risk Assessment General Comments:

1. *Primary Contributors*. The text identifies "primary contributors" of receptor-specific risks and hazards. However, the basis for this identification is not clear and chemical-specific risks and hazards for all identified "primary contributors " are not presented in the text. The HHRA should be revised to (1) clearly identify all chemicals that contribute risks greater than or equal to 1E-06 and/or hazards greater than 1. These chemicals are often referred to as chemicals of concern (COC); these chemicals may also be referred to as "primary contributors".

2. *Chemical-Specific Risks*. In order to facilitate verification and to present sufficient detail, all chemical-specific risks and hazards should be presented to two significant figures (for example, 1.3E-06) and all total risks and hazards to one significant figure consistent with standard risk assessment practice.

3. *Statistical Inconsistencies*. Various inconsistencies were identified in lead statistics in surface soil. For example, Table 2.1 shows a detection frequency of 28/28 and a "number of locations with detections exceeding screening value" of 1/16. Section 3.1.1 states, "Samples [of surface soil] were collected at depths of 0-0.5 feet below ground surface (bgs) and 0.5-2 ft bgs at ten locations (SS-1 – SS10) and from 0-2 ft bgs at six locations (SS11 – SS16). This would suggest a total number of surface soil samples analyzed for lead of (10 locations x 2 depth intervals/locations) + (6 locations x 1 depth interval/location) = 20 + 6 = 26. This does not match the 28 samples listed as part of the detection frequency. Also, in Attachment A (95% UCL Printouts), two sets of soil statistics are presented for lead in soil. The first (page 220 of 840 in Vol_5_Appendix_J_K_L.pdf) lists 26 as the total number of observations, while the second (page 248 of 840 in Vol_5_Appendix_J_K_L.pdf) lists 27 as the total number of observations. Therefore, it seems the HHRA variously presents the number of surface soil samples analyzed for lead as 26, 27, and 28 samples. The HHRA should be revised to consistently and accurately present and use the correct number of lead results in surface soil.

4. *Lead Concentration*. Consistent with EPA guidance, the mean concentration of lead in a medium should be used as the exposure point concentration (EPC) for all receptors except for construction workers/utility workers (EPA 2002). For construction and utility workers, the maximum detected concentration should be used as the medium-specific EPC.

5. *Surrogates*. Throughout the HHRA, a variety of chemicals are retained as COPCs because they were detected, but a medium-specific screening level "has not been published for the constituent." To the extent possible, appropriate surrogates should be used to decrease the uncertainty introduced by not quantitatively characterizing risks and hazards associated with potential exposure to these chemicals. Potential surrogates may include the following:
    a. Acenapthene – surrogate for acenaphthylene
    b. Aroclor 1254 -- noncarcinogenic surrogate for other heavy polychlorinated biphenyls (including Aroclors 1242, 1248, and 1260)
    c. Pyrene -- surrogate for benzo(g,h,i)perylene and phenanthrene
    d. 1,4-dichlorobenzene – surrogate for 1,3-dichlorobenzene

This list is not exhaustive. Other surrogates that can be adequately justified may be presented and used in the HHRA.

6. *Editorial Issues*. The following editorial issues were noted:
    a. The table of contents and text were found to have several errors. Specifically, the subsections for Section 5.3 are mis-numbered as 5.2.1 through 5.2.3 (twice). These subsections should be renumbered as 5.3.1 through 5.3.4. The last subsection of Section 7.3 is mis-numbered as Section 7.3.4. This subsection should be renumbered as 7.3.6.
    b. The abbreviations and acronyms (A&A) list contains numerous entries that are not used in the HHRA (these include, but are not limited to ARAR, BERA, COPEC, and DNR), as well omitting numerous A&A used in the text (these include, but are not limited to AMG, IDNR, IUR, and NRWQC). The A&A list specifically, and the HHRA in general should be revised as necessary so that all entries in the A&A list are used in the HHRA and all A&A used in the HHRA appear in the A&A list.
    c. Various in-text editorial issues were identified including incomplete A&A identification (e.g., R rather than RI [Section 1.0]), not defining A&A at first use or repeatedly spelling out the same A&A over and over). The HHRA should be closely reviewed and editorial issues eliminated.
    d. Numerous examples of incomplete reference citation were noted. Specifically, a year was presented without the necessary alpha identifier necessary to specify which particular year was being referenced (for example, in Section 7.3.2 [page 21], EPA's RSL User's Guide should be specified as EPA 2017c). The HHRA should be closely reviewed to ensure that all references are accurately cited.
    e. Attachment A presents a large number of chemical- and medium-specific 95% upper confidence limit (UCL) outputs from EPA's ProUCL software. Ease of use and understanding of these outputs would be increased if Attachment A were modified to include internal divider/slip sheets identifying medium-specific results, as well as any unique or specialty results.

Appendix J- HHRA Specific Comments:

1. *Section 2.2, Page 4, Paragraph 5*. Section 2.2 is apparently a summary of chemicals of potential concern (COPC) as presented in the RI. However, at this point in the HHRA, COPCs have not been identified. COPCs are identified in Section 4.0 of the HHRA. Section 2.2 should be revised to more clearly identify the differences between COPCs identified in the RI and COPCs as selected and used in the HHRA.

2. *Section 2.3, Page 4, Paragraph 6*. Section 2.3 identifies primary transport mechanisms found at the site. The list does not include uptake of chemicals from surface water and sediment into aquatic species, primarily fish. Such uptake into fish should be added as a primary transport mechanism for the site.

3. *Section 2.4, Page 5, Paragraph 1*. Section 2.4 discusses potential receptors and exposure points. The subject paragraph presents in text form a list of potentially complete exposure

routes for each receptor considered in the HHRA. This list is difficult to follow in text form. This material would be much easier to read and digest if it were presented in bullet form by receptor. Section 2.4 should be revised to present receptor-specific, potentially complete exposure routes in bulleted form.

4. *Section 2.4, Page 5, Paragraph 3*. This paragraph states that the reason why potential exposure via fish ingestion is not quantified in the HHRA is that "there is currently a fish advisory for the entire stretch of the river adjacent to the Site." This may be true, but it is still important to understand whether fishing adjacent to or near the Site is currently taking place or may have been observed historically. Just because an advisory is in place does not mean that no fishing is taking place. Section 2.4 in particular, and the HHRA in general, should be revised to summarize whether fishing from the river adjacent or near to the Site is currently or has historically been observed.

5. *Section 3.1.1, Page 6, Paragraph 2*. Section 3.1.1 discusses surface soil samples considered in the HHRA. The paragraph cites "(Parsons 2016);" this should be revised to 2016b. Also, the paragraph refers to RI Figure 2-7. This figure presents locations of both surface soil and composite sample locations. The paragraph should provide a statement as to whether or not the results from these composite soil samples were considered in the HHRA.

6. *Section 3.1.2, Page 6, Paragraph 3*. Section 3.12 discusses subsurface soil samples considered in the HHRA. The paragraph states that subsurface samples were collected from 13 locations and refers to RI Figure 2-11. However, Figure 2-11 shows only six soil boring locations. Section 3.1.2 should be revised to clarify where the complete set of 13 subsurface soil samples were collected and if multiple samples were collected from some soil borings. Also, the paragraph refers to Table 2.2 for a summary of subsurface data used in the HHRA. Table 2.2 shows that a total of 22 subsurface soil samples were considered. It is not clear how 22 samples were collected from either 6 or 13 locations. Section 3.1.2 should be revised to clarify this point.

   Also, the paragraph states that "only samples collected from 2-12 ft bgs, which is the typical depth of most utility work, were included for evaluation of subsurface soil in this HHRA." Workers engaged in intrusive activity may be exposed to soil from 0-2 feet bgs, as well as from 2-12 feet bgs. Therefore, Section 3.1.2 and the entire HHRA in general should be revised to define and evaluate subsurface soil as 0-12 feet bgs.

7. *Section 3.2, Page 6, Paragraph 4*. Section 3.2 discusses soil vapor/air samples considered in the HHRA. The second sentence of this paragraph states that five landfill gas samples were collected from existing gas vents, but lists six gas vent locations, and refers to RI Figure 2-13, which shows a total of 18 gas vents. The various inconsistencies in Section 3.2 must be resolved and accurate information clearly presented. In addition to resolving numerical inconsistencies, Section 3.2 should explain how the subset of gas vents were selected for consideration in the HHRA.

8. *Section 3.4.1, Page 7, Paragraph 1*. Section 3.4.1 discusses surface water samples from the Northern Pond considered in the HHRA. The paragraph states that surface water samples

were collected from six locations and refers to RI Figure 2-3. Also, the paragraph refers to Table 2.6 for a summary of the surface water data from the Northern Pond considered in the HHRA. However, Figure 2-3 shows six surface water sample locations (matching the text), while Table 2.6 shows that for most analytes, eight surface water samples were considered. Section 3.4.1 should clearly explain how eight surface water samples were collected from six locations.

9. *Section 3.5.2, Page 7, Paragraph 5*. Section 3.5.2 discusses the sediment samples from the Southern Wetland considered in the HHRA. The paragraph states that sediment samples were collected "at depths of 0-1 ft and 1-2 ft, with two locations (SD20 and SD21) sampled for PCBs only at depths of 2-5 ft." Human receptors are expected to be routinely exposed only to surface sediment (0-1 feet). Human receptors are not likely to be exposed to sediment at depths of 1-2 feet and certainly not at depths of 2-5 feet. Therefore, Section 3.5.2 in particular and the HHRA in general should be revised to either (A) provide adequate justification for consideration of subsurface sediment in the HHRA or (B) consider only surface sediment. The second option is preferred.

10. *Section 3.5.3, Page 8, Paragraph 1*. Section 3.5.3 discusses the sediment samples from the river considered in the HHRA. The discussion refers to Tables 2.11a and 2.11b, but does not provide any figure showing where river sediment samples were collected. Section 3.5.3 should be revised to refer to and the HHRA revised to include a figure showing where the river sediment samples used to create Tables 2.11a and 2.11b were collected.

11. *Section 3.7.2, Page 8, Paragraph 4*. Section 3.7.2 discusses background soil data considered in the HHRA. The text states that background soil data are presented in Tables 2.2 and 2.3. This is incorrect; background soil data are presented in Tables 2.1 and 2.2. Section 3.7.2 should be revised accordingly. Also, in addition to using background data from the State of Illinois to compare to soil data collected from the Site which is located in Gary, Indiana, Section 3.7.2 should be revised to cite and discuss background soil data available from the U.S. Geological Survey (USGS) Open File Report 2014-1082, "Geochemical and Mineralogical Maps for Soils of the Conterminous United States" (https://pubs.usgs.gov/of/2014/1082/). Concentrations of various metals can be obtained from the area surrounding any particular site using interactive maps that can be downloaded to Google Earth. Any differences between the background values from the State of Illinois and the USGS report should be noted and discussed.

12. *Section 4.1, Page 9, Paragraph 3*. Section 4.1 discusses the selection of surface soil COPCs. The subject paragraph refers to detection frequency as a criteria that might have been used to eliminate chemicals as COPCs but was not. However, the discussion implies that detection frequency refers to the frequency with which chemicals are detected at a concentration greater than its respective screening level. This is an inaccurate characterization. Detection frequency is the frequency at which a chemical is detected (at any concentration) among all samples from a given set. The discussion in Section 4.1 (and similar discussions in Sections 4.2 through 4.11) should be revised for clarity and even-handedness. Where appropriate, a second and separate statement can be made about the number or frequency chemicals were detected at concentrations exceeding medium-specific screening levels.

13. *Section 4.4, Page 10, Paragraph 1*. Section 4.4 discusses the selection of soil vapor COPCs and refers to Table 2.4. Table 2.4 in turn states that soil vapor screening levels were calculated using the "USEPA Vapor Intrusion Screening Level Calculator for Commercial Use, May 2016." The most recent version of the Vapor Intrusion Screening Level (VISL) calculator is Version 3.5, dated June 2017 (EPA 2017). It produces the same screening levels presented in Table 2.4. Table 2.4 in particular, and the HHRA in general, should reference and use the latest VISL calculator, Version 3.5, dated June 2017.

14. *Section 4.5, Page 10, Paragraphs 2 and 3*. Section 4.5 discusses the selection of groundwater COPCs. The paragraph refers to Tables 2.5a and 2.5b. These tables include both total and dissolved metals results. Section 4.5 and Tables 2.5a and 2.5b should be revised to clarify if and how dissolved groundwater results were considered in the HHRA. Consistent with standard risk assessment practices, groundwater exposures, risks, and hazards should be based on total groundwater concentrations. Note: a similar situation occurs in the discussion of surface water COPCs (Sections 4.6 – 4.8). Surface water exposures, risks, and hazards should be based on total surface water concentrations.

15. *Section 5.2, Page 13, Paragraph 7*. Section 5.2 summarizes exposure assumptions used in the HHRA. The paragraph states, "For most scenarios, the only difference between the RME and CTE scenarios was to use the mean concentration as the EPC instead of the maximum or 95% UCL concentration." This approach is inconsistent with EPA recommendations and standard procedures in EPA Region 5. The same EPCs should be used under both reasonable maximum exposure (RME) and central tendency exposure (CTE) conditions. RME and CTE conditions are more typically differentiated by adjusting other exposure assumptions such as intake rates, skin surface areas, exposure frequencies, and exposure durations. The HHRA should be revised to modify all CTE calculations. The same medium-specific EPCs should be used for both RME and CTE conditions. Revisions to other exposure assumptions to differentiate RME and CTE conditions should be adequately supported and documented.

16. *Section 5.3.3, Page 16, Paragraph 1*. Section 5.3.3 is mistakenly numbered 5.2.3 and summarizes exposure pathways evaluated for site trespassers. The first bullet in this paragraph omits dermal exposure of soil, sediment, and surface water as an exposure pathway considered in the HHRA. Section 5.3.3 should be revised to add dermal exposure to soil, surface water, and sediment as exposure pathways considered in the HHRA.

17. *Section 6.0, Pages 17 and 18*. Section 6.0 presents the toxicity assessment portion of the HHRA. Sections 6.1 and 6.2 refer to Table 5 for chemical-specific toxicity factors. However, both Sections 6.1 and 6.2, as well as Table 5 do not provide any references for the chemical-specific toxicity factors used in the HHRA. Sections 6.1 and 6.2, as well as Table 5 should be revised to provide references for each chemical-specific toxicity factor considered in the HHRA.

18. *Section 6.2, Page 17, Paragraph 4*. Section 6.2 discusses noncarcinogenic toxicity factors used in the HHRA. Section 6.2 should be revised to add a discussion of how oral reference doses (RfD) were used in characterizing noncarcinogenic hazards associated with dermal exposures.

19. *Section 6.3, Page 18, Paragraph 1*. Section 6.3 summarizes how lead toxicity was evaluated in the HHRA. Section 6.3 provides no references for models and assumptions that were considered. Section 6.3 should be revised to provide all necessary references for models and assumptions used to evaluate lead.

20. *Section 7.3.3, Page 23, Paragraph 1*. Section 7.3.3 discusses the risk characterization results for the adult/adolescent site trespasser. In the first sentence of this paragraph, the text notes that contact with sediment is unlikely due in part to "the depth of the sediments below the water." In addition to limiting contact with sediment, overlying water of any substantial depth (for example, greater than 1 foot deep) is likely to wash off all or a large portion of contacted sediment that may initially adhere to exposed skin. Section 7.3.3 in particular and the HHRA in general should be revised to (1) clearly state the depth of overlying water above sediments in the Northern Pond and (2) discuss the potential for overlying water to wash off sediment receptors may contact. (Note: these same revisions should be made regarding discussion potential sediment exposures at the Southern Wetland and the river).

21. *Section 9.0, Pages 29 and 30*. Section 9.0 presents the summary and conclusions of the HHRA. Some of the constituents of concern listed in the in-text tables for current and future land use do not appear to be correct as they are not associated with risks ≥ 1E-06 and/or hazards > 1. These chemicals should be removed from the in-text tables. See below:
    A. Current land use:
        a. Construction/Utility Worker – Aroclor 1254, copper, lead, manganese, and thallium in soil.
        b. Construction/Utility Worker – Aroclor 1254, iron, manganese, and thallium in wetland sediment.
        c. River Recreational User – 2-Methylnaphthalene and naphthalene in Grand Calumet River sediment
    B. Future land use:
        a. River Recreational User – 2-Methylnaphthalene and naphthalene in Grand Calumet River sediment

22. *Section 9.0, Page 31, 4th Bullet*. Section 9.0 presents the summary and conclusions of the HHRA. The fourth bullet discusses chromium speciation at the site. This bullet should be revised to clearly state that no chromium speciation information is available for site soil and chromium speciation information is available only for groundwater samples. This discussion should detail or reference the number of groundwater samples for which chromium speciation information is available.

Appendix K- Streamlined Ecological Risk Assessment General Comments:

1. *SLERA Appendix*. The RI table of contents identifies that SLERA as being Appendix K; however, the cover page for the SLERA identifies the document as "Appendix E, Ecological Evaluation". The cover page should be revised to reflect the correct appendix.

2. *SLERA Scaling Factor*. The SLERA uses an allometric scaling factor to adjust the toxicity reference values (TRVs) for the various receptors evaluated in the food chain model. U.S. Environmental Protection Agency (EPA) Region 5 policy is to not adjust the TRVs with allometric scaling factors. When EPA developed the Ecological Soil Screening Levels (EcoSSLs) (EPA 2005), it did not apply an allometric scaling factor, and this approach needs to be followed in this SLERA. Therefore, the TRVs reported in Section 6 must be revised and the risk characterization be redone. The Risk Assessment Approach Memorandum does not identify that the SLERA will use an allometric scaling approach to adjust TRVs; if it had, this comment would have to be made at that time.

3. *Northern Pond*. There were several references in the report that the Northern Pond is not likely to contain fish due to low dissolved oxygen conditions. It was stated that the Northern Pond does not receive any surface water input; however, there was no discussion on whether the groundwater or other discharges from the former landfill may be impacting the Northern Pond. Since the Northern Pond has been identified as a viable ecological habitat, the SLERA should contain a discussion on what the likely cause(s) is for this depressed dissolved oxygen condition and any resulting impacts on the aquatic receptors in this water body. In addition, the discussion should include any impacts on aquatic receptors in this waterbody resulting from elevated pH and salts, such as calcium, potassium, magnesium, and sodium.

4. *Changes in Procedures/Protocols*. There are specific changes in the procedures/protocols that are noted in the specific comments that are likely to have an impact on the conclusions and recommendations. Those changes should be reflected in the revised text as appropriate.

5. *Editorial Issues*. The following editorial issues were noted:
    A. The screening values provided in Tables 1.1 through 1.7 were not provided in a consistent manner. In some tables, if a constituent was not detected in any samples a screening value was not provided, and in other tables, a screening value was provided regardless of whether the constituent was detected. The information should be presented in a consistent manner in all tables.

    B. Many of the tables contain citations that are not included in the reference section. Either a complete reference should be provided in the table or included as part of the reference section, this will enable the reader to verify the appropriateness of the citation.

Appendix K- SLERA Specific Comments:

1. *Section 1.4, Page 3, Paragraph 0.* This section notes that no threatened or endangered species were observed at the Site. The section should also state if any active methods were used to specifically look for these species, or if the statement is based on casual observation.

2. *Section 4.2, Page 8, Paragraph 4, and Tables 1.2a and 1.2b*. Several issues were noted:
   A. The text notes that Indiana Department of Environmental Management (IDEM) Water Quality Standards Applicable to Waters Within the Great Lakes System (327 Indiana Administrative Code [IAC] 2-1.5) chronic criteria for aquatic life were used as a source of first choice for the screening values. If values are not available from IDEM, then screening values from EPA Region 4's Ecological Risk Assessment guidance (EPA 2015) were used. It appears this approach was not uniformly followed. In addition, there were incorrect screening values used in the table, as noted with the following constituents:

Constituent	Provided Value (µg/L)	Correct Value (µg/L)	Source
Anthracene	0.68	0.02	EPA Region 4
Naphthalene	26	21	EPA Region 4
Arsenic, dissolved and total	147.9	190	IDEM
Manganese, dissolved and total	755	93	EPA Region 4
Mercury, dissolved/ total	0.77/0.91	0.012	IDEM
Selenium, dissolved and total	4.6	35	IDEM

   B. Also, all hardness-based values need to be revised: cadmium, chromium, copper, lead, nickel, and zinc. The table footnote states that values are based on a water hardness of 398 milligrams per liter (mg/L) as calcium carbonate (CaCO3); however, when the values were checked using the equations specified by IDEM they did not match the values provided. These values need to be recalculated and correct values provided.

   C. This section makes the conclusion that since constituent concentrations are below the acute screening values, it is not likely that there will be impact to aquatic life. Although EPA guidance notes that acute values can be used as a refinement value, the evaluation must consider the duration of exposure that is associated the acute value. In most cases, the acute standard assumes less than one day of exposure, and since the exposure point is a pond, the application of acute values that assumes less than a 24-hour exposure is not appropriate and should be removed from the SLERA. Rather, an evaluation of risk should be based on a comparison to the chronic values.

D. The assessment notes the presence of elevated levels of salts: sodium, potassium, magnesium, and calcium. However, there is no discussion on the potential implications of the elevated values on the potential impact to the receptors. This should be added to the discussion.

3. *Section 4.3, Page 8, Paragraph 5, and Tables 1.3a and 1.3 b*. Several issues were noted:
   A. As noted in Specific Comment No. 2, there were incorrect screening values used in these tables. In addition to the constituents noted in the previous comment, problems were noted with the following constituents:

Constituent	Provided Value (µg/L)	Correct Value (µg/L)	Source
Bromodichloromethane	3,100	340	EPA Region 4
Dibromochloromethane	340	320	EPA Region 4

   B. Also, as noted above, all hardness-based values need to be revised: cadmium, chromium, copper, lead, nickel, and zinc. The table footnote states that values are based on a water hardness of 398 mg/L as CaCO3; however, when the values were checked using the equations specified by IDEM they did not match the values provided. These values need to be recalculated and correct values provided.

   C. This section also makes that conclusion that since constituent concentrations are below the acute screening values, it is not likely that there will be impact to aquatic life. As noted in Specific Comment No. 2, the text needs to be revised to reflect the comparison to the chronic rather than acute values.

4. *Section 4.4, Page 8, Paragraph 5, and Tables 1.4a, 1.4 b, 1.5a and 1.5b*. As noted in Specific Comments No. 2 and 3, there were incorrect screening values used in these tables and include the constituents identified in the previous two comments. This section also makes the conclusion that since constituent concentrations are below the acute screening values that it is not likely that there will be impact to aquatic life. As noted in specific Comment No. 2, the text needs to be revised to reflect the comparison to the chronic rather than acute values.

5. *Section 4.5, Page 9, Paragraph 3, and Table 1.6*. The table provides screening values for the sediment constituents detected in the Northern Pond sediments. A screening value is provided for high molecular weight (HMW) polycyclic aromatic hydrocarbons (PAHs); however, this value is for total PAHs (EPA 2015). The table should be revised to note that sediments are not evaluated by either low molecular weight (LMW) PAHs or HMW PAHs, but rather total PAHs. Since PAHs have been identified as a constituent of potential ecological concern (COPEC) for the Northern Pond, PAHs should be further evaluated using the EPA protocols outlined in its guidance (EPA 2003 and 2010). Although it is preferred to have collected data on alkylated PAHs in the sediments to more accurately assess the potential risk, EPA (2010) provides correction factors for the various PAHs that are likely to

be alkylated. This protocol provides procedures to estimate potentials risks by using adjustment factors for specific measured PAHs that compensates for the missing data. This protocol also will provide an assessment based on both chronic effects (based on no observed adverse effect levels [NOAEL]) and acute effects (based on lowest adverse effect levels [LAOEL]).

6. *Sections 4.6, Page 10, Paragraph 1, and Table 1.7 and Section 4.7, Page 10, Paragraph 2, Table 1.8*. As noted in Specific Comment No. 5, these tables also provide a screening value for HMW PAHs that is actually for total PAHs. The table should be revised to reflect the correct screening value. Since PAHs have been identified as a COPEC for the southern wetland sediment, it would be appropriate to further evaluate PAHs by using the EPA protocols outlined in its guidance (EPA 2003 and 2010) as describe in Specific Comment No. 5.

7. *Section 5.1, Page 11, Paragraphs 2 and 3, and Table 2a*. The text describes the approach for determining the exposure point concentrations used in the SLERA. It notes that 95% upper confidence levels (UCL) were used to estimate potential risks. This complies with EPA guidance (EPA 2015) for the evaluation of a refined approach. However, the text also notes that the average concentration (mean value) will also be used to evaluate risks. This is not consistent with EPA guidance, which specifically states that the 95% UCL should be used to assess average conditions. Therefore, the mean values should be removed from the SLERA and should only use the 95% UCLs as the exposure point concentrations. The only exception, as noted in the text, was where there are insufficient samples to calculate a 95% UCL, and the maximum value must be used as the exposure point concentration. The text also states that all 95% UCLs printouts from the ProUCL program are provided in Attachment A. There are no printouts provided for the South Wetland Sediment, so the values provided in Table 2a could not be verified. These printouts need to be provided.

8. *Section 5.2, Page 12, Paragraph 2, and Table 3.2a and 3.2b*. The text provides an equation used to estimate wetland invertebrate concentrations based on the sediment concentrations, and biota-sediment accumulation factors (BSAF). Tables 3.2a and 3.2b provide BSAFs for various chemicals detected in the sediments and reference the U.S. Army Corps of Engineers (USACE) BSAF database (2008). No specific citation is provided in the reference section for this source. SulTRAC identified a USACE BSAF database on-line that was dated 2017 (USACE 2017). SulTRAC spot-checked the BSAFs provided for the chemical group – PAHs. The footnote states the value is based on all species for total PAHs were used since no data were available for invertebrates. Using the currently available database, SulTRAC was not able to confirm the PAH value provided in the table – the values identified by SulTRAC ranged from 2.4 to 2.6, depending on whether only total PAH data was used, or if BSAFs for each individual PAH were included. The more recent database should be utilized and BSAFs for all compounds be verified. The tables note that the total organic carbon data was measured by "Piwoni", but no citation information is provided in the reference section and the text does not provide any justification as to why this data is relevant. This needs to be included in the text. The footnotes in both tables reference "USEPA 1999". However, the full reference is not provided in either table and is not included in the reference section.

Either a complete reference should be provided in both tables or should be added to the reference section.

9. *Section 5.2, Page 12, Paragraph 3, and Table 3.3a and 3.3b*. The text provides an equation used to estimate small mammal prey concentrations based on sediment concentrations and the application of a transfer factor for the sediment concentrations. The transfer factors identified in the table are referenced to Travis and Arms 1988. This study looked at the relationship between the octanol-water partition coefficient (Kow) and the uptake of organic compounds into milk and beef. It was based on concentrations in the feed, so these transfer coefficients are only applicable for concentrations in food sources for small prey, not for the transfer from sediments to small prey. The assessment must first estimate concentrations in plants or invertebrates and then apply the transfer factors to those concentrations rather than to the sediment concentrations.

10. *Section 6.0, Page 16, Paragraph 2, Table 6*. This section presents a protocol for the development of LOAEL based TRVs, based on the source study. Consistent with EPA guidance, the TRVs used in the SLERA should be based on chronic exposures only. It is consistent with EPA guidance to use chronic TRVs based on NOAELs and LOAELs (EPA 2015). The SLERA should use EPA's EcoSSLs (EPA 2005) as its primary source for its TRVs, rather than selecting individual studies, as provided in Table 6. The EcoSSL supporting documentation also contains information on toxicity values based on LOAELs and by following the EcoSSL protocol (EPA 2005) a TRV can be developed that would represent a probable effect level. The SLERA should be revised to limit the risk characterization to TRVs from the EcoSSL protocol (EPA 2005). If toxicity values are not available from the EcoSSL protocol, EPA Region 9 Biological Technical Assistance Group Reference Toxicity Values for Mammals and for Birds (EPA 2002) can be used as a resource for both NOAEL and LOAEL based TRVs. The table presents toxicity values as individual PAH compounds. To be consistent with EPA guidance, the PAH compounds should be grouped by high molecular weight and low molecular weight and the appropriate TRVs used (EPA 2007).

11. *Section 6.0, Page 16, Paragraph 3, and Section 7*. The text provides an equation for the allometric scaling factors that were used to adjust the TRVs for various receptors. As noted in General Comment No. 2, the use of allometric scaling factors is not consistent with EPA guidance and should not be used in the risk assessment. The risk characterization section of the risk assessment will need to be revised to reflect the changes required by this comment and the SLERA's conclusion may also be changed based on the recalculations of the site ecological risks.

12. *Section 7.1, Pages 18 and 19*. The text notes that concentrations of various chemicals of ecological concern (COPECs) appear to increase with depth. However, data is not presented in the SLERA to support this statement, and no reference is provided where this data can be found in the RI report. Either the data or reference needs to be provided, or the statement removed from the report. The text also compares wetland sediment concentrations to soil and sediment benchmarks from the Calumet Ecotoxicology Roundtable (2007). It is more appropriate to compare the soil and sediment values to ecological screening values or

refinement screening values from EPA Region 4 guidance (2015), which considers more recent studies.

13. *Section 7.2, Pages 19 – 21*. As noted in Specific Comment No. 12, this section also refers to variations of COPECs by depth without any documentation to support this conclusion. The documentation needs to be provided or a reference to the RI where this information is provided. Also, as noted above, there are references to the screening benchmarks from the Calumet Ecotoxicology Roundtable (2007). It is more appropriate to compare the sediment values to ecological screening values or refinement screening values from EPA Region 4 guidance (2015).

14. *Section 9, Page 23*. Due to the number of comments provided above that will significantly impact the outcome of the food chain model and the risk characterization, this section will need to be revised to reflect these changes.

Appendix L- Preliminary Remedial Action Objectives Memorandum General Comments:

1. *Technical Memorandum*. The Preliminary Remedial Action Objectives Technical Memorandum may require updating to ensure that it addresses all risks following resolution of the comments on the HHRA and SLERA.

2. *RAOs*. As written, there are four RAOs before any of the comments. The RAOs should be rewritten to be broader in scope, yet simpler. A conference call may be the best way to agree on RAOs.

Appendix L- Preliminary RAOs Memorandum Specific Comments:

1. *Landfill Gas*. Landfill gas is not discussed as an RAO. An RAO to prevent the migration of landfill gas (including gas with COCs and methane) from leaving the property at concentrations which pose a health or explosion risk should be included.

2. *Groundwater and Leachate*. Groundwater and leachate is not discussed. The RI documents that there is groundwater with COCs exceeding the MCLs, which has a presumption of needing to be addressed. Groundwater use on the site will have to be prohibited. Furthermore, there will be a need to prevent the river from recontamination following the cleanup/dredging of the river. An RAO to address groundwater/leachate exceeding screening levels (including MCLs) from leaving the site should be included. Suggested language: Prevent groundwater and/or leachate from leaving the site at concentrations which exceed MCLs or other drinking water standards, and at concentrations which may result in recontamination of the river or ecological harm to the river.

3. *Southern Border NAPL*. The NAPL present on the southern border of the site contains PCBs at concentrations in excess of 50 ppm and will likely be considered a principal threat waste. The NAPL will have to be addressed through an RAO.

4. *Suggested RAOs*. The following is a list of suggested RAOs based on use of the presumptive remedy guidance:
    A. RAO 1: Prevent human exposure to groundwater or leachate which poses unacceptable risks. Additionally, prevent ecological receptors from unacceptable risks due to contact or food chain exposures from groundwater and leachate at A) the edge of the waste management area (for groundwater/leachate) and B) at the receptor point (for ecological receptors).

    B. RAO 2: Prevent on-site and off-site exposures to landfill gas at concentrations which pose an unacceptable risk to humans, either due to health effect or potential explosive risks.

    C. RAO 3: Prevent ecological receptor exposures to sediments with COCs creating unacceptable risks from both the southern wetland and the northern pond.

D. RAO 4: Prevent the consumption of fish by A) humans and B) ecological receptors with COCs at concentrations creating unacceptable risks.

E. RAO 5: Removal or treatment of principal threat wastes (i.e., NAPL) to the maximum extent practical.

Attachment 1

IDEM Comment Letter

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
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Eric J. Holcomb
Governor

Bruno L. Pigott
Commissioner

April 18, 2018

Ms. Leslie Blake
USEPA Region 5
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, IL 60604

Dear Ms. Blake:

Re: Remedial Investigation Report for the Gary Development Landfill Superfund Site, Gary, Indiana

Our review of the above referenced Remedial Investigation Report (Report) has generated the following comments:

- Figure 1-3: Not all of the yellow rectangles are actual Indiana Superfund Sites as indicated in this figure.

- According to the validation reports, the data was found to be usable for the overall project goal (with qualifications). Since there were no laboratory reports included in the report, the validation reports could not be verified.

- The report states that contamination has been vertically defined. Knowing that: several borings were terminated and/or wells installed at depths with elevated PID readings; vinyl chloride (VC) in MW-06D was above the screening level during all sampling events; and 1,4-dioxane concentrations were above criteria in the deeper wells, is it assumed that the glacial till underlying the sand aquifer is impervious to all vertical migration?

Risk Evaluation

- It appears that several contaminants characteristic of landfills including ammonium and nitrate were not analyzed for the samples collected. With the potential impact to human health and ecological risk from these contaminants, please consider evaluating them in future monitoring and investigation events.

- Parsons states in the text of the report that EPA Region 5 ecological screening levels updated in 2003 were used, while the attached Streamlined Ecological Risk Assessment (SLERA) (Appendix K) suggested EPA Region 4 ecological screening levels updated in 2015 were used. Parsons needs to clarify the ecological remediation objectives.

While we support the use of capping/containment as the presumptive remedy, additional information and clarification to the Report should be provided by Parsons. Please do not hesitate to contact me at (317) 234-0358 should you have any questions.

Sincerely,

Stephanie Andrews
Senior Environmental Manager
Federal Programs Section
Office of Land Quality

SA:tr
cc: Rex Osborn, IDEM

References Cited

EPA. December 1989. *Risk Assessment Guidance for Superfund.*
EPA. December 1993. *Wildlife Exposure Factors Handbook.*
EPA. June 1999. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments Interim Final.*
EPA. August 25, 2015. *Region 4 Ecological Risk Assessment Supplemental Guidance.*